



# UNITED STATES PATENT AND TRADEMARK OFFICE

*cy*  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,319	06/20/2003	Jay M. Short	09010-029011	6967

25225 7590 01/29/2007  
MORRISON & FOERSTER LLP  
12531 HIGH BLUFF DRIVE  
SUITE 100  
SAN DIEGO, CA 92130-2040

EXAMINER
----------

RAMIREZ, DELIA M

ART UNIT	PAPER NUMBER
----------	--------------

1652

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/29/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



**DETAILED ACTION**

***Status of the Application***

Claims 1-3,6,11-12, 20-22, 50-68 are pending.

Applicant's amendment of claims 1-3, 11, 20-22, 50-60, addition of claims 63-68 and cancellation of claims 13-17, as submitted in a communication filed on 10/27/2006 is acknowledged.

Applicant requests reconsideration of the restriction requirement for the reasons presented in the previous response. Applicant submits that Groups III and IV should be rejoined in a generic group. Applicant reserves the right to petition for review of the restriction requirement at any time prior to appeal. Applicant's arguments has been fully considered but not found persuasive. As indicated previously, a method for recombinantly producing each one of the specific phytases recited (i.e., SEQ ID NO:2 and 10) is considered a patentable distinct invention. There is no evidence on the record indicating that the phytases of SEQ ID NO:2 and 10 are obvious variations of each other. Thus, unless applicant provides some evidence indicating that these phytases (i.e., SEQ ID NO:2 and 10) are obvious variations of each other, the inventions of Groups III and IV are considered properly restricted.

This application contains claims 3 and 6 drawn to an invention non-elected with traverse in a communication filed on 5/1/2006. A complete reply to the final rejection must include cancellation of non-elected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

New claims 65, 68 are directed in part to non-elected subject matter. They will be examined to the extent they encompass the elected subject matter. It is noted that claims 11-12 were inadvertently omitted from the list of examined claims in the previous Office action. Claims 1-2, 11-12, 20-22, 50-68 are at issue and are being examined herein.

Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 10/27/2006 is acknowledged. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

***Specification***

2. Applicant's amendments to the first paragraph of the specification updating the current status of prior applications and amendments which deleted hyperlinks, as submitted in a communication filed on 10/27/2006 are acknowledged.

***Terminal Disclaimer***

3. The terminal disclaimer filed on 10/27/2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of (1) U.S. Patent No. 6190897, (2) U.S. Patent No. 5876997, and (3) any patent granted on Application Number 09/777566 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Claim Objections***

4. Claims 1, 50, 53-64, 67 are objected to due to the recitation of "an *E. coli* bacteria". This should be amended to recite "an *E. coli* bacterium". Appropriate correction is required.
5. Claims 11-12 and 61-62 are objected to due to the recitation of "the method of claim 1 wherein the yeast cell" and "the method of claim 51/53 wherein the yeast cell. Claims 1, 51 and 53 refer to a yeast whereas claims 11, 12, 61, 62 refer to yeast cells. It is suggested that for consistency a single term be used for all these claims, either yeast or yeast cells. If amended, Applicant is requested to review all claims referring to yeast/yeast cells to ensure consistency of terms. Appropriate correction is required.

Art Unit: 1652

6. Claims 52, 65, 68 are objected to as being directed in part to non-elected inventions.
7. Claims 51, 53, 55 are objected to due to the recitation of "sequence isolated from an *E. coli* bacterium". As known in the art, nucleotide sequences are graphical representations of the order in which nucleotides are arranged in a nucleic acid molecule. Therefore, it is the nucleic acid and not its sequence what can be isolated from a bacterial cell. Appropriate correction is required.
8. Claims 54, 56 and 66 are objected to due to the recitation of "wherein the homologous signal sequence or the heterologous signal sequence (signal peptide) comprises a secretory signal peptide" and "amino acid sequence comprising an N-terminal identification peptide". As indicated above, a sequence is a graphical representation. Thus, a sequence cannot comprise a peptide. For examination purposes, it will be assumed that the claim reads "wherein the homologous signal peptide or the heterologous signal peptide comprises a secretory signal peptide". It is noted that, if amended, additional claims may require amendments to maintain the proper antecedent basis. Appropriate correction is required.
9. Claim 57 is objected to due to the recitation of "wherein the nucleic acid wherein the nucleic acid". This should be amended to recite "wherein the nucleic acid" once. Appropriate correction is required.

***Claim Rejections - 35 USC § 112, Second Paragraph***

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
11. Claims 1-2, 11-12, 20-22, 50-68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This rejection is necessitated by amendment.
12. Claims 1, 51, 53, 55, 66 (claims 2, 11-12, 20-22, 50, 52, 54-65, 67-68 dependent thereon) are indefinite due to the recitation of "nucleic acid/nucleic acid sequence isolated form an *E. coli* bacterium"

Art Unit: 1652

for the following reasons. While one of skill in the art would understand the term “nucleic acid isolated from an *E. coli* bacterium” as a naturally-occurring *E. coli* nucleic acid, it appears that the term “isolated from an *E. coli* bacterium” as used in these claims is intended to encompass any nucleic acid encoding a phytase isolated from recombinant as well as wild-type *E. coli*. For example, dependent claims 3 (not examined in the instant application) and 50 (examined in this application) refer to the method of claim 1, wherein the nucleic acid has different sequences (i.e., SEQ ID NO: 1 and 9). The specification teaches that SEQ ID NO: 2 and 10 (encoded by SEQ ID NO: 1 and 9, respectively) correspond to the amino acid sequences of man-made variants of a naturally-occurring *E. coli* phytase. Thus, the limitations in claims 3 and 50 appear to indicate that the intended scope for the genus of nucleic acids recited in claim 1 is beyond naturally-occurring nucleic acids encoding *E. coli* phytases. Similar limitations in claims 52, 64-65, 67-68 indicate that the intended scope for the genus of nucleic acids recited in claims 1, 51, 53, 55, 66 is not limited to naturally-occurring *E. coli* nucleic acids encoding a phytase. For examination purposes, the term “isolated from an *E. coli* bacterium” will be interpreted as “isolated from a recombinant or wild type *E. coli* bacterium”. As such, the nucleic acids recited in claims 1, 51, 53, 55, 66 will be interpreted as being any nucleic acid which encodes a phytase, in view of the fact that a recombinant *E. coli* cell can have any exogenous nucleic acid. Correction/clarification is required.

13. Claim 66 (claims 67-68 dependent thereon) is indefinite in the recitation of “nucleic acid encodes a phytase comprising (A) a homologous signal sequence, (B) a phytase lacking a homologous signal sequence...(D) the phytase-encoding nucleic acid of ...” because it is unclear as to how a phytase comprises another phytase as required in (B), or how a phytase comprises a nucleic acid as required in (D). In addition, the term “sequence encoding a coding and/or non-coding sequence is unclear and confusing as the term “coding” and “non-coding” refers to nucleic acids and the term “sequence encoding” refers to the sequence of a region of a nucleic acid which codes for a protein. Thus, it is unclear as to how a nucleic acid sequence can encode another nucleic acid sequence. It is also noted that

Art Unit: 1652

it is unclear as to whether the method requires providing the nucleic acids of (1) (i) or (ii), or (2) (i) and (ii). For examination purposes, it will be assumed that the claim recites "wherein the phytase-encoding nucleic acid (1) encodes a phytase (A) comprising a homologous signal sequence, (B) lacking a homologous signal sequence, (C) comprising a heterologous...., or (2) encodes the phytase encoded by the nucleic acid of (1) and further comprises (A) a coding and/or non-sequence sequence, or (B) a sequence encoding an N-terminal identification peptide imparting....characteristic; and (ii) a sequence fully complementary to (i); and (b) expressing.....". Correction is required.

***Claim Rejections - 35 USC § 112, First Paragraph***

14. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

15. Claims 55-56 were rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement due to the presence of new matter.

16. In view of the fact that these claims now refer to an N-terminal identification peptide imparting a desired characteristic, which is a limitation supported by the specification (page 64, lines 22-27), this rejection is hereby withdrawn.

17. Claims 1-2, 20-22, 51, 53-62 remain rejected and claims 11-12, 66 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Art Unit: 1652

18. This rejection has been discussed at length in the Non Final action mailed on 7/25/2006 and is necessitated by amendment as it relates to claim 66. This is a new rejection as it relates to claims 11-12. It is applied to these claims for the reasons of record and those set forth below.

19. Applicant argues that the term "derived" has been deleted and that the claims are now directed to a method of using two types of phytases: those known in the art and the phytases of SEQ ID NO:2 and

10. Applicant submits that Dassa et al. originally described the appA phytase from *E. coli* strain K12.

Because the methods of the invention only use known phytases, applicant submits that the claimed invention is adequately described.

20. Applicant's arguments have been fully considered but are not deemed persuasive to overcome the instant rejection or avoid the rejection of claims 11-12 and 66. Claims 11-12 encompass the same genus of nucleic acids required by the method of claim 1. Claim 66 requires a genus of nucleic acids encoding any phytase. The Examiner acknowledges the phytase of Dassa et al. as well as the disclosure of the phytases of SEQ ID NO:2 and 10. However, as indicated above with regard to the 35 USC 112, second paragraph rejection of the claims, it appears that the term "isolated from an *E. coli* bacterium" as used in these claims is intended to encompass any nucleic acid encoding a phytase isolated from recombinant as well as wild-type *E. coli*. It is reiterated herein that the phytases of SEQ ID NO:2 and 10 are man-made variants of a naturally-occurring *E. coli* phytase. Thus, while claims 1, 51, 53, 55, 66 appear to limit the genus of phytases made by the method to those phytases found only in wild-type *E. coli* (naturally-occurring), the dependent claims suggests a different scope which encompass any phytase since a recombinant *E. coli* cell can comprise any nucleic acid. See discussion above. Contrary to applicant's assertions, the claims encompass not only the phytases of SEQ ID NO:2 and 10 as well as a known *E. coli* phytase but rather any phytase. A genus of nucleic acids encoding any phytase is not adequately described by the teachings of the specification for the reasons extensively discussed in the previous Office action.



Art Unit: 1652

Thus, one cannot reasonably conclude that the specification adequately describes a method for recombinantly produce any phytase in yeast.

21. Claims 1-2, 20-22, 51, 53-62 remain rejected and claims 11-12, 66 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method to recombinantly produce the polypeptide of SEQ ID NO: 10, does not reasonably provide enablement for a method to recombinantly produce any phytase. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

22. This rejection has been discussed at length in the Non Final action mailed on 7/25/2006 and is necessitated by amendment as it relates to claim 66. This is a new rejection as it relates to claims 11-12. It is applied to these claims for the reasons of record and those set forth below.

23. Applicant argues that the claims are now directed to a method of using two types of phytases: those known in the art and the phytases of SEQ ID NO:2 and 10. Applicant submits that Dassa et al. originally described the appA phytase from *E. coli* strain K12. Because the methods of the invention only use known phytases, applicant submits that the skilled artisan can make the recited phytases without undue experimentation. Thus, applicant concludes that the rejection under the enablement requirement of section 112, first paragraph can be properly withdrawn.

24. Applicant's arguments have been fully considered but are not deemed persuasive to overcome the instant rejection or avoid the rejection of claims 11-12 and 66. As indicated above, the examiner acknowledges the disclosure of the phytases of SEQ ID NO:2 and 10 as well as the *E. coli* phytase disclosed by Dassa et al. However, the examiner disagrees with applicant's contention that the claimed method only requires recombinant production of known phytases. As previously discussed, the scope of the claims as recited appears to encompass not only production of naturally-occurring *E. coli* phytases but

Art Unit: 1652

encompass any phytase as the genus of nucleic acids recited in claims 1, 51, 53, 55, and 66 is not limited to those nucleic acids encoding naturally-occurring *E. coli* phytases but it also encompasses nucleic acids encoding phytases isolated from any recombinant *E. coli* cell. Since recombinant *E. coli* cells can comprise any nucleic acid, the genus recited is not limited to nucleic acids encoding naturally-occurring *E. coli* phytases. Contrary to applicant's assertions, the claims encompass not only the phytases of SEQ ID NO:2 and 10 as well as a known *E. coli* phytase but rather any phytase. Thus, it would require undue experimentation to practice the claimed method as one of skill in the art would have to isolate/make any nucleic acid encoding a phytase. For the reasons extensively discussed in the previous Office action, recombinantly producing any phytase is deemed to require undue experimentation. Therefore, one cannot reasonably conclude that the claimed method is fully enabled by the teachings of the specification and/or the prior art.

***Claim Rejections - 35 USC § 102***

25. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
26. Claims 1-2, 20-22, 51, 53-62 remain rejected and claims 11-12, 66 are rejected under 35 U.S.C. 102(e) as being anticipated by Berka et al. (U.S. Patent No. 5866118, issued 2/2/1999, filed 3/18/1997).
27. This rejection has been discussed at length in the Non Final action mailed on 7/25/2006 and is necessitated by amendment as it relates to claim 66. This is a new rejection as it relates to claims 11-12. It is applied to these claims for the reasons of record and those set forth below.
28. Applicant argues that after entry of the amendment filed on 10/27/2006, the claimed method is limited to use of an *E. coli* nucleic acid encoding a phytase, which is not a limitation taught or suggested by Berka et al.

Art Unit: 1652

29. Applicant's arguments have been fully considered but are not deemed persuasive to overcome the instant rejection or avoid the rejection of claims 11-12 and 66. Claims 11-12 are directed to the method of claim 1 with the added limitation that the yeast cell is *S. cerevisiae*, *S. pombe*, *S. occidentalis*, *P. pastoris* or *H. polymorpha*. Claim 66 is directed in part to a method for recombinantly producing any phytase in yeast, wherein said phytase can have its endogenous signal peptide or a heterologous signal peptide in place of its endogenous signal peptide. For the reasons extensively discussed above, the term "isolated from an *E. coli* bacterium" has been interpreted as "isolated from a recombinant or wild type *E. coli* bacterium". Thus, the nucleic acids recited in claims 1, 51, 53, 55, 66 have been interpreted as being any nucleic acid which encodes a phytase, in view of the fact that a recombinant *E. coli* cell can have any exogenous nucleic acid. While the examiner acknowledges that the nucleic acid encoding the phytase of Berka et al. is not from *E. coli*, Berka et al. teach a method for the recombinant production of a phytase in *S. cerevisiae* wherein signal peptides are used for secretion of the phytase. See previous Office action for a more detailed description of the teachings of Berka et al. Thus, the method of Berka et al. anticipates the claimed method as interpreted

### ***Claim Rejections - 35 USC § 103***

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

31. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of

Art Unit: 1652

each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

32. Claims 1-2, 11-12, 20-22, 51, 53-62, 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ostanin et al. (J. Biol. Chem. 267(32):22830-22836, 1992; cited in the IDS) in view of Berka et al. (U.S. Patent No. 5866118, issued 2/2/1999, filed 3/18/1997). This rejection is necessitated by amendment to the extent that the term "isolated from an *E. coli* bacterium" refers to "isolated from a wild-type *E. coli* bacterium".

As indicated in the previous Office action, Berka et al. teach cloning and recombinant production of a *Thermomyces lanuginosus* phytase (Figures 1 & 2). Berka et al. teach the recombinant production of the phytase in *S. cerevisiae* (column 17, lines 10-21) transformed with expression vectors (column 13, lines 62-31) which contain ADH and GAL yeast promoters (column 13, lines 49-50). Berka et al. also teach the use of signal peptides for secretion of the phytase (column 12, lines 1-48) and the use of small extensions to the phytase to aid in purification such as polyhistidine tags, antigenic epitopes, and binding domains (column 3, line 66-column 4, line 3). Berka et al. do not teach the production of a naturally-occurring *E. coli* phytase.

Ostanin et al. teach the recombinant production of the protein encoded by the *E. coli* appA gene (page 22832, Results, Overexpression of the appA gene). The appA protein, as correctly pointed out by Applicant in the response of 10/27/2006, is a protein having phytase activity. This *E. coli* phytase contains an endogenous signal peptide. Ostanin et al. do not teach production of this *E. coli* phytase in yeast.

Claims 1-2, 11-12, 20-22, 51, 53-62, 66 of the instant application as interpreted are directed in part to a method for recombinantly producing any phytase in a yeast cell, wherein said method requires transforming the yeast cell with a vector comprising a nucleic acid encoding the phytase, wherein said

Art Unit: 1652

nucleic acid is operatively linked to a promoter, wherein said vector is an expression vector, a plasmid, a phage, a phagemid, a cosmid, a fosmid, a bacteriophage, or an artificial chromosome, wherein said promoter is inducible or constitutive, wherein said inducible promoter is a GAL promoter, wherein said constitutive promoter is an ADH or LEU2 promoter, wherein said yeast cell is *S. cerevisiae*, *S. pombe*, *S. occidentalis*, *P. pastoris* or *H. polymorpha*, wherein said phytase comprises a signal peptide which is either homologous or heterologous, and wherein said phytase is secreted by the yeast cell. See Claim Rejections under 35 USC 112, second paragraph for claim interpretation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recombinantly produce the phytase of Ostanin et al. in a yeast cell such as *S. cerevisiae*. A person of ordinary skill in the art is motivated to produce the phytase in yeast because, as known in the art, production of recombinant proteins in yeast is highly desirable as this expression host cell allows for efficient secretion of the recombinant protein to the extracellular medium, thus providing a product which is easier to purify. One of ordinary skill in the art has a reasonable expectation of success at expressing the nucleic acid of Ostanin et al. in yeast since Berka et al. teach different yeast cells and expression vectors for recombinant protein production as well as the fact that expression in yeast cells is well known and widely used in the art. Therefore, the invention as a whole would have been prima facie obvious to a person of ordinary skill in the art at the time the invention was made.

### ***Double Patenting***

33. Claims 1, 11-12, 50, objected to under 37 CFR 1.75 as being a substantial duplicate of claims 51, 61-63. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). Claim 1 requires the nucleic acid to be expressed. Claim 50 requires the nucleic acid to be operably linked to a

Art Unit: 1652

promoter. As known in the art, for expression to occur, a promoter is required. Therefore, the nucleic acid of claim 1 is the same as that of claim 50 since the nucleic acid of claim 1 would require a promoter to be expressed.

34. Claims 1-2, 20-22, 51, 53-62 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 9 of U.S. Patent No. 5876997.

35. Claims 1-2, 20-22, 51, 53-62 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 9 of U.S. Patent No. 6190897.

36. Claims 1-2, 20-22, 51, 53-62 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 13, 28-29, 46, 81, 89-91, 94-96 of copending Application No. 09/777566.

37. In view of Applicant's submission of a terminal disclaimer disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of (1) U.S. Patent No. 6190897, (2) U.S. Patent No. 5876997, and (3) any patent granted on Application Number 09/777566, these rejections are hereby withdrawn.

#### ***Allowable Subject Matter***

38. A method to recombinantly produce the polypeptide of SEQ ID NO: 10, wherein said method requires culturing a yeast cell transformed with a polynucleotide encoding the polypeptide of SEQ ID NO: 9, is allowable over the prior art of record.

#### ***Conclusion***

39. No claim is in condition for allowance.

40. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published applications may be obtained from

Art Unit: 1652

either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delia M. Ramirez whose telephone number is (571) 272-0938. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Ponnathapura Achutamurthy can be reached on (571) 272-0928. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.



Delia M. Ramirez, Ph.D.  
Patent Examiner  
Art Unit 1652

DR

January 15, 2007